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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/512,016

06/27/2005

Hans-Joachim Barth

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11/12/2010

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EXAMINER

VELASQUEZ, VANESSA T

ART UNIT

PAPER NUMBER

1733

MAIL DATE

DELIVERY MODE

11/12/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/512,016	Applicant(s) BARTH ET AL.	
	Examiner Vanessa Velasquez	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-17, 20-23 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-17, 20-23 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

Claims 1-11, 18, 19, 24, and 26 remain canceled. Claims 12-17, 20-23, and 25 are pending and presented for examination on the merits. Of the pending claims, claims 12, 23, and 25 are independent.

Status of Previous Rejections Under 35 USC § 112

The previous rejections of claims 12-17, 20-23, and 25 under the first paragraph of 35 U.S.C. 112 are maintained. Applicant explains that support for the enlargement and lengthening of the second grain size with respect to the first grain size is found in paragraphs [0012]-[0013], [0029], and Figure 3 of the disclosure. The Examiner does not dispute that enlargement and lengthening are supported in the original disclosure. What is at issue is the use of the term "exclusively" in the claims because the term is not found in the specification in the manner described in the claims. It is suggested that the term be deleted from the claim to overcome this rejection.

The previous rejection of claim 14 under the second paragraph of 35 U.S.C. 112 is withdrawn in view of the amendment to the claim.

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 12-14, 16, 17, 20-23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (US 6,242,808 B1) in view of Fan et al. (US 4,309,225), and further in view of Jiang et al. ("Line Width Dependence of Copper Resistivity," *IEEE*). The claims stand rejected for at least the reasons presented in the Office action dated 6/8/2010.

3. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (US 6,242,808 B1) in view of Fan et al. (US 4,309,225) and Jiang et al. ("Line Width Dependence of Copper Resistivity," *IEEE*), as applied to claim 12 above, and further in view of Higuchi et al. (JP 61-30027, English abstract). The claim stands rejected for at least the reasons presented in the Office action dated 6/8/2010.

Response to Arguments

4. Applicant's arguments filed 9/8/2010 have been fully considered but they are not persuasive.

Applicant asserts that the Examiner did not show how the prior art meet the claimed enlarging and lengthening limitations. The Examiner respectfully disagrees. On page 6 of the Office action, Figures 3A and 3B of Shimizu et al. are cited to illustrate that metal grains are enlarged after heat treatment. Page 6 also discloses that the scanning heat treatment by laser produces aligned grains. The result of the laser

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scanning is evident in Fan et al. (i.e., the larger, elongated grains in the direction of scanning, e.g., col. 4, lines 36-42, Figures 2 and 3, etc.).

To aid Applicant in understanding the prior art, attention is drawn to Fan et al. The scanning of a laser beam over a substrate produces grains that are relatively large. The enlargement occurs generally on all grain boundary fronts, including in the direction of the scanning direction, and lengthening is observed (FIGS. 2 and 3). It should be noted that while Fan et al. focus on amorphous semiconductors, the same crystallization method may apply to metals, including those that are partially crystalline (col. 13, lines 46-56). The results of heating metal contacts are illustrated by both Jiang et al. (Fig. 1) and Shimizu et al. (FIGS. 3A and 3B), wherein grains of copper contacts are enlarged with respect to grains before heat treatment. Thus, one of ordinary skill in the art would understand that the scanning heat treatment of Fan et al. would enlarge and lengthen the metal grains of Shimizu et al. and Jiang et al. relative to prior grains and in the direction of the applied heat, as shown by the success of Fan et al. and the expected success shown by Shimizu et al. and Jiang et al.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vanessa Velasquez whose telephone number is 571-270-3587. The examiner can normally be reached on Monday-Friday 9:00 AM-6:00 PM ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached at 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Vanessa Velasquez/
Examiner, Art Unit 1733

/Scott Kastler/
Primary Examiner, Art Unit 1733